



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: 400 M Street, N.W., Washington, D.C. 20540  
WWW.USPTO.GOV

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
10-066,598	02-06-2002	Makoto Okabe	33082M0231	5428

441 7590 04-17-2003

SMITH, GAMBRELL & RUSSELL, LLP  
1850 M STREET, N.W., SUITE 800  
WASHINGTON, DC 20036

EXAMINER
----------

MACARTHUR, SYLVIA

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 04-17-2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/066,598

Applicant(s)

OKABE ET AL.

Examiner

Sylvia R MacArthur

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

### Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Terminal Disclaimer*

1. The terminal disclaimer filed on 3/31/03 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of US 6,355,109 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 11- 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Os et al (USP 5,792,272) in view of Shinjiro.

Van Os teaches plasma enhanced chemical processing reactor 10 includes a process chamber 16. The process chamber (vessel, 16), which is attached to and communicates with plasma assembly 11. Within the process chamber 16 is wafer support (susceptor, 20), which supports a wafer 24 to be processed. The wafer support 20 is substantially aligned with the axis of process chamber 16. Positioned beneath the wafer support 20 and substantially axially aligned with the axis of the process chamber 16 is a (vacuum) pump 26. Van Os teaches this "on-axis" pumping promotes symmetrical flow of gases within reactor 10. Pump 26 is a turbo pump (turbomolecular) as discussed in col. 9 lines 56-67.

A vacuum system is provided for exhausting the reactor 10. A vacuum pump 26 is operatively coupled to the process chamber 16 by port 25. The exhaust port communicates with the pump and opening to the interior of the processing vessel, wherein the port is arranged in the

floor of the vessel annularly and uniformly. Note the port is also arranged around the susceptor for mounting the substrate thereon.

The wafer 24 is lowered onto and raised from the support surface 52 by a lifting assembly (not shown).

Van Os fails to disclose the specific structure of the vacuum pump.

Shinjiro discloses a turbomolecular vacuum pump 1 having stator blades within a casing 2 in an axial direction thereof, and rotor blades 11 which are located between respectively adjacent stator blades 10 and are mounted on an outer periphery of a rotor situated centrally to the casing. A motor rotor (driving mechanism) 17 is fixed to a rotating member that is formed of the rotor having the rotor blades fixed to the outer periphery, and a motor stator 18. Opposite to the motor rotor is arranged so as to construct the drive mechanism for the rotating member. Note the pump of Shinjiro is configured in a toroidal shape.

The turbomolecular pump includes a casing 2 with a suction port 3 that is adapted to be disposed in from of another vacuum device (not shown).

The motivation to use a turbomolecular pump structured as Shinjiro teaches is that it exhibits excellent evacuation performance in a molecular flow region, and is achieve the high degree of vacuum required in semiconductor process vessels.

Therefore, it would have been obvious by one of ordinary skill at the time of the claimed invention to provide the pump of Van Os with the structure and components discussed in Shinjiro.

#### ***Response to Arguments***

4. Applicant's arguments filed March 31, 2003 have been fully considered but they are not persuasive. Applicant argues that Van Os fails to disclose a) a driving mechanism below the

susceptor. The examiner reminds applicant that the prior art rejection in view of Van Os was made under 103 and not a 102. It should be noted that Van Os was used as a primary reference to teach a pump below a susceptor. Van Os does not teach the specific details of said pump. As a result the teachings of Shinjiro were relied upon. Figs. 1, 3, and 4 of Shinjiro all illustrate toroidal shaped pumps with motors (driving mechanism). Thus, the pump of Shinjiro was used to modify the apparatus of Shinjiro.

### ***Conclusion***

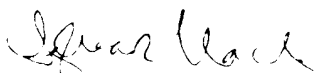
**5. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

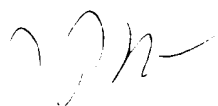
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization

where this application or proceeding is assigned are 703-872-9630 for regular communications and 703-872-9630 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Sylvia R. MacArthur  
September 24, 2002

  
RECEIVED  
SEP 25 2002  
FEDERAL BUREAU OF INVESTIGATION  
U.S. DEPARTMENT OF JUSTICE